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## BOTANICAL OBSERVATIONS IN ICELAND AND SPITZBERGEN \*

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GARDEN.

In July of this year the writer was so fortunate as to have the opportunity of visiting some of the islands of the northern seas of Europe, and it is hoped the following notes may prove of interest to others who are as ignorant of the countries seen as the writer was.

The steamer was in port often for a few hours only, in one or two places for thirty-six hours, and the excursions on land never went far inland or off the regular roads. A small trunk already well filled, and nothing but a life preserver to press specimens with made it necessary to keep the collections very small; therefore the list of plants observed does not pretend to be complete, especially as the writer was unfamiliar with the flora of northern Europe.

After a couple of days in Edinburgh, one being spent in the city and the other in a hurried trip through the Trosachs, we reached Kirkwall in the Orkney Islands in the middle of the day. Substantial stone or brick houses with small windows and little yards or gardens made a typical Scotch town. The sycamore maple and the beech were the most conspicuous trees, and they were evidently glad of the shelter of houses, for exposed specimens were blown sideways by the strong winds, and the surrounding hills looked bare of trees or shrubs. All the seasonable vegetables and flowers were growing in the cultivated grounds near the town, but as the old Saint Magnus Cathedral and the ruins of the bishop's and the earl's palaces were well worth looking at there was no chance to get into the real country.

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## THORSHAVN, FAROE ISLANDS

A misty, cool day and the few trees or cultivated flowers made us feel as if we were getting rather far north. Perhaps the many rocks and high winds discouraged farming or else fishing was a more profitable industry; at any rate the season was late and probably short, although the friendly fisherwomen declared they did not have a cold winter, and that it frequently was no colder than the day we were there. Grass was luxuriant on the sodded roofs of many of the tiny houses of the very picturesque little settlement, and some of the spring flowers were still in bloom — such as buttercups, marigold, forget-me-not, daisy, *Viscaria vulgaris*, and a pink stone crop. A species of *Sorbus*, broad leaved willow, mountain ash, alder, hawthorn, and maple, grew behind buildings, and in the yards were rhubarb, potatoes, and gooseberries. Some people who had gone inland came back with orchids, somewhat like the English *Orchis pyramidalis*, in their button-holes, which showed that a walk on those bare hills might lead to interesting discoveries. All the inhabitants turned out to receive us and were so cordial and clean, that in spite of the difficulties of speaking Danish we would have been tempted to remain for a few days had it been possible.

On leaving Thorshavn our course took us through our first fiord, between Stromoe and Osteroe, and it was all the more impressive because unexpected. High terraces of bare rocks gave way to mountains with sides so sheer that the sheep seemed clinging to precipices, and multitudes of sea birds rose in whirring clouds from the deep fissures, startled by the unaccustomed sound of our whistle. The hills crowded in upon the waters until we could toss a biscuit ashore on either side; clouds hung low, lifting momentarily to reveal higher peaks beyond; the wind caught in such narrow valleys howled in the rigging, and as we had a glimpse of open sea through two majestic, jagged guardians of this gloomy passage, all the blasts of Boreas at once bore down upon us, and threatened rough waters outside — but instead the waves were not ruffled, the sun came out and the wind went as abruptly as it had come, while we went on our way to Iceland awed by such a strange farewell from those volcanic islands.

## ICELAND

Pointed snow summits emerging above pink clouds and blue water was our first picture of Iceland, and all one wonderful day we watched the mountains assume more solid form, and could scarce believe our eyes when we came abreast of the vast Jokull ice fields which reached very nearly to the sea; gradually the coast became less wintry in aspect, and as we got around to the west side and passed between the Westmann Islands we could see grass on the hill slopes.

The approach to the harbor of Reykjavik was during a ten o'clock simultaneous sunset and moon rise, and our anchor was hardly down before we were greeted by a boat load of young women and men, who made a circle of our ship singing their native songs. The town of Reykjavik has no beauty; the houses are of wood covered with corrugated iron as a protection against fire, and have none of the picturesqueness of the little fishing village of Thorshavn. The harbor was large and occupied by a number of whaling or fishing boats, and on a clear day must have been rather fine in its setting of snow-patched mountains, but clouds hung low on the 11th of July veiling the sun sufficiently to interfere with taking photographs. The country around the town was destitute of trees or color, and the hills were not high enough to be impressive. Even a New England farmer would be in despair at the stones of Iceland, and one is surprised to see any grass or plant growth when one looks at the unpromising soil, if it can be called that. I believe the flowers and vegetables I saw in the yards in the town must have been grown on imported earth, and yet there were little fields of fairly thick grass which was most carefully cherished as hay for the ponies. One man came to the gate of his yard when he saw me looking at his garden, and we had a peculiar talk, he knowing no English and very little German and I no Danish, so the Latin names of the plants furnished our means of communication. His plants looked as if they had been set out about a year, and I understood that they were not all native and certainly the trees were dwarfed and pathetic in appearance; he had growing the mountain ash and sycamore maple both 5-6 feet tall, *Ribes alpina*,

*Lonicera* (?) in bloom, rhubarb, potatoes, poppies, and young cabbages, *Caragana Sibirica*, and either a geranium or a malva. In another garden I observed tulips, phlox, forget-me-nots, *Sorbus*, and, on a new lawn, a bunch of *Corprinus*. On a drive a couple of miles inland to see the hot springs where the women wash their clothes, I noticed patches of pink thyme in among the stones, and, where the ground was wet, cotton grass and real grass and a number of little inconspicuous things were taking



FIG. 1. On the road between Reykjavik, Iceland, and the Salmon River. Pink thyme, *Statice* and *Silene maritima*, *Polygonum viviparum* and some other little plants growing in scattered clumps among the stones.

advantage of favorable conditions, such as *Statice maritima*, *Silene maritima* and *S. acaulis*, *Polygonum viviparum*, *Alchemilla alpina*, *Galium verum*, and *Tofieldia palustris*.

There was a pony race in the afternoon after a very good concert, and it took place on a great level plain which was one mass of little stones with about a dozen plants in a square yard; a desolate spot but gay with people gathered from the ends of the

earth watching those sturdy, fleet little horses scamper over the course.

#### AKREYRI

As the clouds lifted in the late afternoon of the 12th we found we were close to the north coast, which here shows plainly its volcanic origin as the mountains were craters or half craters of considerable height and regularity, every basin and flank touched with patches of snow; and it was surprising how level the layers of rock or lava deposits were, seldom tipped or broken though worn by weather into cathedral columns, or when painted by the



FIG. 2. Bell Sound, Spitzbergen; in foreground *Saxifraga*, *oppositifolia*, *Dryas octopetala* and *Cassiope tetragona*.

rosy rays of a low evening sun, turned into veritable Valhallas, fit abodes for northern heroes. We wound far up a beautiful fiord to a whaling station and saw four dead monsters, and met another being towed in by a little tug hardly bigger than the whale. The settlement of Akreyri, which is called the second largest town of Iceland, is situated at the end of a long fiord and surrounded by high hills, which here have retreated a short dis-

tance from the water, leaving lower grassy slopes which make good farms for the fishermen. As at Reykjavik there was nothing attractive about the little town, and we all walked a mile inland to a brisk river which took a thirty or forty foot plunge into a small canyon. It was refreshing to sit near the falls as it was a warm day, and here was the best collecting ground I had found, both for flowering plants and mosses. *Dryas octopetala* was very pretty and common; *Eriophorum angustifolium* and *E. vaginatum*, *Parnassia palustris*, and *Viola tricolor* made bright spots of color; and *Pinguicula vulgaris* was in cracks of the damp rocks, where *Racomitrium lanuginosum* and several *Grimmias* were mixed with *Distichium capillacium*, *Tinnia austriaca* or *Philonotis fontana*. There were also *Empetrum nigrum*, *Galiums*, *Erigeron alpina*, *Silene acaulis*, and yarrow, dandelions, and sorrel, but no trees or shrubs.

It took us three hours to steam out of the fiord and about 7 P. M. we crossed the Arctic circle and had a call from Neptune, who invited us to be present at the baptismal ceremonies on deck the next afternoon, and then he disappeared astern floating away in a smoking barrel. We could scarcely believe we were within the Arctic circle it was so mild, only 55° F. on deck after dinner, and the sun gave up any attempt at setting. The next two days at sea however were cooler, and in the evening we sighted an ice floe off to the northwest where Greenland was not very far away, and the thermometer said only 39° F.

#### SPITZBERGEN

It was pleasant to have reached a place where the birds were so tame and so numerous as at Advent Bay. There were funny ones, puffins I think, which could not rise from the water but flapped their wings frantically and half walked in a zigzag path, graceful gulls often sitting on the icy water within ten or twenty feet of the boats, and many others I did not know, and all in great numbers. The island is well named Spitzbergen, its peaks are generally very pointed, very steep and pretty much covered with snow, and the valleys are filled with great glaciers whose ends break off into the waters of the Bay, which is also said to be the

terminus of the Gulf Stream. There was little floating ice, it was too late in the season. A couple of whaling boats, a steamer come to get coal from a mine recently opened which has remarkably good, hard coal, and, on the land, the mining buildings and one or two houses for the workmen, and a shanty put up for the occasional hunter, were the only signs of life in this great arena of dazzling snow, black rocks, and blue water. We brought with us the best day the isolated men had had for the year, and our pilot, a whaler of forty years experience, declared the bay was more open and the seas quieter than he had ever known them.



FIG. 3. Merok, in the Geirangerfjord, Norway. The tree is a white birch, and there are plenty of flowers and grass and other birches part way up the mountains, which are perhaps 4,000 feet high.

We went ashore merely to say we had set foot on Spitzbergen, and wondered why otherwise we took the trouble, it looked so uninteresting. At the point where we landed there was a plateau of great extent about six feet above the level of the shingle beach, and composed of flat stones, probably left by a retreating glacier; what had looked like a barren field of rock proved to be

a garden with many dainty little flowers about six inches high, which forced their way between the stones. Here were the Iceland poppy (*Papaves radicum*), *Saxifraga oppositifolia*, either pink or white and with a delicate odor, *Pedicularis lanata*, *Potentilla emarginata*, and *Pulchella*, and *Cerastium Edmonstoni*, these last three very hairy, *Dryas octopetala*, a *Draba*, perhaps *lapponica*, and *Cassiope tetragona* making quite a turf or bog where melting snow was near it, and with it the tiny *Salix retusa*. There were a number of mosses but none with fruit, and I brought back specimens of only *Polytrichum gracile*, *Hypnum uncinatum*, and of *Grimmias* not yet identified. The *Pedicularis lanata* was most beautiful growing on the very edge of a snow bank, nestled in between the stones and daintily protected by its veil of grey hairs, through which the pink of the waiting flowers shone.

Many of the climbers achieved the summit of the nearest mountain, and it was appallingly steep as we looked at their progress from below, over the sliding, wet stones, with no ledges or trees to afford a foothold and a deep ravine with a milky river rushing far below them. When they were ready to come down they sat down on the snow and coasted, and we on a much lower shoulder found it the best way to get over the half melted banks we encountered. The light for taking photographs was better at 1 A. M. than it had been twelve hours earlier when we came into the bay, and we all stayed up to see the weighing of the anchor and the sun at our northernmost point of the trip; and indeed, it was the night of nights to stay up there was so much that was beautiful and strange to see.

Later in the morning we woke at *Bell Sound*, a favorite harbor of whalers, where three or four immense glaciers empty into one little bay. Here again we had marvellously clear skies and were deceived as to distances, so opinions varied as to the breadth and height of the glaciers, whether two miles or five, and forty feet or one hundred in height. Unfortunately there was not time to walk on any of the glaciers. Perhaps the Captain felt such weather was too good to last long, so we sadly bade adieu to the regions of clean snow and magnificent distances, and in a



couple of days, towards eight o'clock one evening, first beheld that great rock called the North Cape of Norway.

#### NORTH CAPE

It seemed like being in the tropics to see such a luxuriant growth of grass, butter-cups, geraniums, sweet yellow violets, pink campion, saxifrages, etc., as were wild in the somewhat sheltered valley up which the exceedingly steep path zigzagged to the flat top of the great cliff. But the first steps on the wind-swept stony summit were as devoid of plants as the plains of Iceland had been. Walking to the very edge we looked off to the sun just at its lowest point for that night, it being then twelve o'clock, and proved the photographer's warning useless in this instance for we could take pictures when the sun was just at setting or rising. From this height of about 900 ft. there was a fine view of the other bays and headlands, only less tremendous than the one we were on, of which the coast is composed.

In the Lyngenfiord still well to the north of the Arctic Circle, we spied our first trees, white birches, and many other flowers; and here too we visited the Laplanders in their summer camp in a beautiful valley within sight of a fine glacier. At Diger-mulen on the Lofoten Islands we climbed a mountain about 1,100 ft. high to get a view of many fiords and islands and snowy summits, and on the way up noticed the following plants: *Calluna vulgaris*, white heather or lyng, which is supposed to have suggested the name of the Lyngenfiord, violets, *Cornus suecicia*, *Lotus corniculatus*, which I had last seen in bloom on the South Downs of Sussex in early June, *Trientalis Europoea*, *Vaccinium*, *Vitis idaea*, *Andromeda polyfolia*, very fresh pretty pink, *Rubus chamaemorus*, and dwarfed willows, and *Betula nana*, also many mosses and ferns.

I will make no attempt to enumerate the flowers in the remaining places we visited, because they were too many and are well known to anyone familiar with the European flora or even with the English country at this season of the year, but must mention two places we stopped at because of their surpassing beauty. Merok is at the end of the very narrow Geirangerfiord

and is like a gem of deep blue-green color in a setting of lofty, jagged mountains, whose lower parts are good farms well watered by countless falls and brimming brooks. The other is Gudvangen and Stalheim, which we reached by driving eight miles up the Naeroedal, a valley at the base of mountains 4,000–5,000 ft. almost sheer from sea level, and so close together that our necks ached with the effort of seeing their summits. At the end of the drive we walked up the winding road to the Stalheim cliff and hotel, from which we had a fine view down the narrow valley and the many mountains one behind the other until they faded into the blue distance. Those two places were a fitting conclusion to a most interesting journey and are within easy reach of Bergen. In the little botanical garden in Bergen I found in flower and named some of the plants I had noticed in the yard of the man in Reykjavik.

I am indebted to Mr. Rydberg for naming the plants I brought back, which are now in the New York Botanical Garden herbarium.

## NOTES ON UROMYCES

BY JOHN L. SHELDON

In the spring of 1906, I found an *Uromyces* on a number of plants of *Sisyrrinchium graminoides* Bick., usually associated with *Aecidium houstoniatum* Schw. on *Houstonia caerulea* L. Mention has been made of this in a previous number of *TORREYA*,<sup>1</sup> together with a description of the *Uromyces* and the results obtained from inoculations made in the field. Observations and inoculation have been kept up for the past three years. Successful inoculations of plants of *Sisyrrinchium graminoides*, with aecidiospores from *Houstonia caerulea*, have been obtained each year. During the winter and spring of 1907, I finally succeeded in obtaining aecidia on a few plants of *Houstonia caerulea*, grown in the greenhouse and inoculated with teleutospores from *Sisyrrinchium graminoides*. These results showed that the *Uromyces* and the *Aecidium* are different stages of the same rust. And

<sup>1</sup> A rare *Uromyces*. *Torreyia* 6 : 249–250. D 1906.